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Convergent and discriminant validity of religiosity measures among church members and non-members

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Abstract

The applicability of religiosity measures among people who are not affiliated to a church is an important prerequisite for its use in religiously heterogeneous populations. This paper provides a confirmatory factor analysis of Intrinsic, Extrinsic and Quest (IEQ) religiosity measures and Glock's religiosity dimensions among church members and non-members. Moreover, it shows correlations between IEQ and Glock's dimensions. A three-factor solution of IEQ religiosity is found for both groups. Factor loadings were comparable between groups. Although theoretically fine, high inter-factor correlations question the empirical usefulness of the IEQ distinction for non-member samples. Glock's dimensions are also comparable between groups and correlate strongest with Intrinsic and Extrinsic but weakly with Quest religiosity. The results stress the complementary characteristics of both perspectives on religiosity.

Keywords: Religiosity; Validity; Church membership; Confirmatory factor analysis

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1. Introduction

The distinction of Intrinsic, Extrinsic (Allport, 1950, 1959; Allport & Ross, 1967) and Quest (Darley & Batson, 1973) religiosity has produced an enormous debate in the psychology of religion (see Hood, Spilka, Hunsberger, & Gorsuch, 1996; Wulff, 1997). One of the issues is that the traditional measurement instruments for these religious orientations (e.g. Batson & Schoenrade, 1991a, 1991b; Gorsuch & Venable, 1983) are only applicable to religious people (Donahue, 1985; Kirkpatrick, 1989; Maltby, McCollam, & Millar, 1994). Hence, only religious people can be compared among themselves, while the more interesting comparison of religious with non-religious people is impossible. To enable the inquiry of non-religious people, Maltby suggested adaptations to the measurements (Maltby and Day, 1998; Maltby and Lewis, 1996).

A further prerequisite to the comparison of religious and non-religious people is that the measurement instruments have comparable psychometric characteristics for both groups. In this paper we will test the convergent and discriminant validity and reliability of Intrinsic, Extrinsic and Quest (IEQ) religious orientation items with a sample from one of the most religiously heterogeneous countries, the Netherlands (Verweij, Ester, & Nauta, 1997). Doing this, we will improve on previous research in three ways.

First, previous tests of reliability of IEQ measurements have mainly used non-representative samples consisting of religious students, seminarians, and members of specific churches (Batson & Schoenrade, 1991b; Batson, Schoenrade, & Ventis, 1993; Batson & Ventis, 1982; Finney & Malony, 1985; Hills, Francis, & Robbins, 2005; Hilty, Morgan, & Hartman, 1985). We will study religiosity measures with a representative Dutch sample. This will provide us with more insight in the quality of these measurements when used in a religiously heterogeneous population. Furthermore, we will test reliability or convergent validity – high correlations between measurements for the same construct – and discriminant validity – low correlations between measurements for different constructs (Van der Vijver, 2003a, 2003b) for both church members and non-members simultaneously.

Second, previous research mainly used principal component analysis (PCA) of scales rather than items (Batson et al., 1993; Batson & Ventis, 1982; Finney & Malony, 1985). This procedure is flawed for two reasons: (a) scale scores do not provide insight in cross-loadings of items on other dimensions and (b) PCA assumes no measurement error, while each measurement actually has some error. Batson and Schoenrade (1991b) analysed a pool of items while allowing measurement error, but used varimax rotation which assumes zero correlation between factors. However, correlations between religious orientations are seldom zero (see Donahue, 1985). Moreover, most research explores rather than tests factor structures. Testing requires that all relevant items are included simultaneously in the analysis while imposing restrictions on cross-loadings. Although a confirmatory factor analysis (CFA) has been published recently (Hills et al., 2005), psychometric characteristics of the measurement instruments are not compared between religious and non-religious people. Therefore, we will perform CFA of IEQ items, comparing both groups and allowing measurement errors and correlations between factors.

Third, although the distinction between IEQ religious orientations has highly influenced social scientific research on religion, it is certainly not the only important way to assess dimensions of religiosity. The influential studies of Glock and Stark (1965, 1966; Stark & Glock, 1968) distinguished different dimensions of religiosity: *practice, belief, experience* and *consequences*.

Huber (2002) argued that Glock's dimensions are part of an Intrinsic or *centrality* dimension. We will test Huber's claim by empirical analysis of the relations between IEQ and Glock's dimensions.

1.1. Religious orientations

In the discussion on religious orientations, several dimensions have been distinguished. Allport (1950, 1959; Allport & Ross, 1967) used the terms Intrinsic and Extrinsic to describe two motivations. People with an *Intrinsic* motivation 'live' their religion. For them, religion is most important in their life, all other things are brought into harmony with it. People with an *Extrinsic* motivation 'use' their religion for their own ends e.g., for security, social activities, etc. Initially, Intrinsic and Extrinsic motivations were regarded as opposites of a continuum. However, research with the Religious Orientation Scale (ROS) showed that the two motivations formed two dimensions (Allport & Ross, 1967; Feagin, 1964; Wilson, 1960).

According to Batson (1971; Batson & Ventis, 1982) the ROS does not adequately operationalise several aspects of what Allport originally meant with Intrinsic religiosity: (1) facing complex problems without reducing their complexity, e.g., on morality and ethics (2) readiness to doubt and self-criticism and (3) tentativeness or openness to change in religious belief. Therefore, Batson developed a scale to measure these aspects of religiosity. Analyses showed however, that this *Quest* scale formed a third religious orientation.

One of the criticisms on the IEQ tradition focused on the specific Christian formulation of the measurement instruments. The inability of many non-Christian people to answer the questions makes it impossible to use IEQ scales in religiously heterogeneous samples (Kirkpatrick, 1989; Maltby et al., 1994). Maltby suggested adaptations to the questionnaire in order to enable the inquiry of less- or non-religious people (Maltby & Day, 1998; Maltby & Lewis, 1996). Maltby asks to what extent statements apply to the respondent instead of to what extent they agree. Nearly all respondents can answer the adapted items.

1.2. Glock's dimensions

Another important perspective on religiosity was developed by Glock and Stark (1965, 1966; Stark & Glock, 1968). They distinguished *practice, belief, experience* and *consequences* dimensions of religiosity. *Practice* points to public practice – church membership and attendance – and private practice – e.g., prayer. *Belief* refers to e.g., belief in God and afterlife. *Experience* stands for religious emotions and revelations. *Consequences* refers to the importance of religion in people's daily lives. Indicators for these dimensions of religiosity are widely used in cross-national surveys on religiosity (e.g. Inglehart et al., 2000; ISSP, 1993, 2000; Jagodzinski & Dobbelaere, 1999).

Up to now, there has not been empirical research on relations between IEQ and Glock dimensions of religiosity. Recently, Huber (2002) did some theoretical work to integrate the Intrinsic and Extrinsic religious orientations with Glock's dimensions. Huber distinguishes *centrality* as main religious factor and regards Glock's dimensions as aspects of centrality. However, Huber neither uses the Quest dimension of religiosity nor does he provide empirical evidence for his

theory. We aim to fill this gap with our empirical approach of investigating both multidimensional distinctions of religiosity.

2. Methods

2.1. Data

In the winter of 2000–2001 the 'Religion in Dutch Society' survey was held (Eisinga et al., 2002). A two-stage stratified random sample method was used to obtain a representative sample of Dutch citizens between 18 and 70 years old. 1008 interviews were realised, representing a response rate of 43, 7%. The sample was representative for the Dutch population with regard to gender and marital status; people younger than 29 years old are slightly underrepresented. The sample is religiously heterogeneous: 59% of the respondents did not regard themselves as church member. Of those who are a church member, 55% is Catholic, 36% Protestant (Reformed) and the remaining 9% belongs to other Christian churches. Respondents were asked whether they would be willing to cooperate in future research. Those who agreed received during the autumn of 2003 an additional questionnaire containing items on IEQ religiousness. Of the 929 mailed questionnaires, 512 returned. Response to the additional questionnaire was not significantly related to Glock's dimensions of religiosity or marital status. However, females ($\exp(B) = 1.56$; $p < .01$) and older people ($\exp(B) = 1.02$; $p < .001$) returned the additional questionnaire more often.

2.2. Measurements

2.2.1. Religious orientations

Religious orientation items are derived from Maltby (Maltby & Day, 1998; Maltby & Lewis, 1996) and carefully translated into Dutch by a professional team (Harkness, 2003).[1] The items are presented in Table 2. Previous research showed that religious orientations are best measured with four categories (Koskinen-Hagman, 1999). To give respondents also the opportunity of a neutral answer, we used a five-point scale from 'does not apply to me at all' to 'completely applies to me'.

2.2.2. Glock's dimensions

As operationalisation of church membership, respondents were asked whether they consider themselves a member of a Christian church or religious community. This information is used to distinguish members from non-members in our analyses. Operationalisations of Glock's dimensions of religiosity are presented in Table 5 and comparable to other surveys (e.g. Inglehart et al.,

[1] One item was rephrased: in stead of 'I would prefer to go to Church more than once a week' we used 'I like to go to Church' since church attendance of more than once a week is unusual in the Netherlands. To save space we eliminated some items that are similar to other items: "I go to Church because it helps me make friends", "I go to Church mainly because I enjoy seeing people I know there", "God was not very important to me until I began to ask questions about the meaning of my own life", and "I have been driven to ask religious questions out of a growing awareness of the tensions in my world and in my relation to my world".

2000; ISSP, 1993, 2000; Jagodzinski & Dobbelaere, 1999). Church attendance was asked as 'attending services of a church or religious community' with four response categories from 'hardly ever/never' to 'about once a week', which are recoded into church attendance a year (0–52). Frequency of prayer was asked as 'Do you ever pray?' with four response categories from 'never' to 'often'. The belief dimension was measured as Christian worldview, indicated by a scale of 10 statements. Answer categories ranged in five steps from 'not convinced at all' to 'entirely convinced'. Religious experience was operationalised as experiencing God in nature with five answer categories ranging from 'do not agree at all' to 'agree entirely'. Respondents who considered themselves to be church members responded to five statements with regard to consequences of Christian faith with a five-point response scale ranging from 'do not agree at all' to 'agree entirely'. Respondents who indicated that they were non-members got a similar scale about worldview instead of Christian faith.

2.3. Analysis

To test the factor structure of IEQ items, we performed multi-group confirmatory factor analyses with LISREL (Jöreskog & Sörbom, 1993a, 1993b). We compared nested models on the bases of several fit indicators: χ^2, RMSEA, GFI and BIC (Bollen, 1989; Raftery, 1993, 1995). First, we tested the fit of the theoretical factor model for church members and non-members simultaneously. Items were only allowed to load on their theoretical factor. Second, we inspected modification indices in order to improve the fit of the factor solution. Poorly fitting items – either loading higher on other factors or behaving differently for the two groups – were eliminated. Also following modification indices, significant covariances between error variances were allowed, since there may be clusters in the data that are not completely accounted for by the theoretical three-factor model (e.g., two items that share the word 'church').

A similar procedure was used to analyse the factor structure of Glock's dimensions. Since consequences of religiosity and worldview were only asked to church members and non-members, respectively, we could not impose equal factor loadings between groups on consequences items.

Subsequently, we analysed relations between factor solution for IEQ and Glock's dimensions with SPSS. Factor scores are computed as the mean of scores on items multiplied by their factor loading. Relations between IEQ and Glock dimensions are analysed with partial correlations.

3. Results

3.1. Confirmatory analyses of IEQ factors

First, we tested the fit of one (I/E/Q), two (I/E and Q) or three (I, E and Q) factor models, imposing equal loadings for both groups. All test statistics showed that the three-factor model of IEQ items has a significantly better fit than the other models (see Table 1).

According to BIC, the model is satisfactory (BIC < 0), but χ^2 is still significant, RMSEA is high ($>.05$) and GFI low ($<.90$). Post-hoc analysis for non-members only showed also best fit estimates

Table 1
Fit estimates for confirmatory factor analysis of IEQ items

Structure	χ^2	df	p	RMSEA	Group GFI Member		BIC
					Yes	No	
1-factor IEQ	5966	756	.000	.173	.440	.652	1330
2-factor IE/Q	3527	754	.000	.127	.596	.704	−1097
3-factor I/E/Q	3073	750	.000	.116	.631	.726	−1527
-E1	2862	696	.000	.116	.646	.725	−1407
-E3	2264	644	.000	.105	.712	.737	−1686
-E7	1927	594	.000	.099	.745	.752	−1716
Allow error covariances and different error variances	1108	544	.000	.067	.805	.863	−2228

$N_{\text{Members}} = 178$; $N_{\text{NoMem}} = 283$.

for the three-factor model. This confirms that the three-factor structure applies also to non-members.

Table 2 shows the factor loadings of IEQ items on their pre-supposed dimensions while other loadings are fixed to zero. Nearly all items loaded substantially on their theoretical factor, showing convergent validity. One item (E1) conflicts with other Extrinsic items. Therefore we excluded this item from further analyses, which lowered χ^2 although BIC increased (see Table 1).

Modification indices indicated that two Extrinsic items (E3 and E7) did not fit the three-factor model because of stronger (negative) loading on the Intrinsic factor among church members (−.98 and −.82, respectively), indicating poor discriminant validity. Deletion of these items improved the factor solution substantially according to all test statistics (see Table 1). Nonetheless, the model remained suboptimal (χ^2 is significant; RMSEA > .05; GFI < .90).

Allowing error covariances and differences in error variances between groups, when indicated by modification indices, improved the model substantially according to all criteria (see Table 1). The model is still suboptimal, but turned out to fit much better than at first sight. Factor loadings of IEQ items in the final model are presented in Table 2.

Correlations between the factors are higher among non-members than among church members (see Table 3). This indicates that the distinction of IEQ religious orientations is most relevant for church members.

3.2. Confirmatory analysis of Glock's dimensions

The items indicating Glock's dimensions showed a relatively good fit with regard to their theoretical factor structure (see Table 4). BIC is strongly negative and RMSEA is .05. However, χ^2 ($p < .001$) and GFI (<.90) indicate suboptimal fit. None of the items fitted poorly according to modification indices, but there are some significant error covariances as well as significant differences in error variances between groups. Allowing these exceptions results in a model with a non-significant χ^2 ($p > .05$) and satisfactory GFI (>.90). Factor loadings for Glock's dimensions are represented in Table 5. The correlations between factors are remarkably low for church attendance and consequences of worldview among non-members (see Table 6).

Table 2
Factor loadings of three-factor confirmatory factor analysis of IEQ items

	Item	Initial			Final		
		I	E	Q	I	E	Q
I1	I try to live all my life according to my religious beliefs	.748			.734		
I2	Prayers I say when I am alone are as important to me as those I say in Church	.585			.655		
I3	It is important for me to spend time in private thought and prayer	.695			.690		
I4	I have often had a strong sense of God's presence	.737			.762		
I5	I enjoy reading about my religion	.602			.594		
I6	I would rather join a Bible study group than a church social group	.517			.470		
I7	My religion is important to me because it answers many questions about the meaning of life	.775			.812		
I8	My whole approach to life is based on my religion	.730			.678		
I9	I like to go to Church	.525			.528		
E1	It doesn't matter what I believe so long as I am good		.157				
E2	What religion offers me most is comfort in times of trouble and sorrow		−.734			.715	
E3	Although I am religious, I don't let it affect my daily life		−.450				
E4	I go to Church mostly to spend time with my friends		−.271			.235	
E5	I pray mainly to gain relief and protection		−.784			.791	
E6	I pray mainly because I have been taught to pray		−.497			.444	
E7	Although I believe in my religion, many other things are more important in life		−.435				
E8	Prayer is for peace and happiness		−.789			.781	
E9	Sometimes I have to ignore my religious beliefs because of what other people might think of me		−.462			.464	
Q1	Questions are more central to my religious experience than are answers			.539			.540
Q2	I do not find religious doubts upsetting			.256			.237
Q3	There are many religious issues on which my views are still changing			.756			.753
Q4	I am constantly questioning my religious beliefs			.728			.752
Q5	As I grow and change, I expect my religion also to grow and change			.788			.794
Q6	My life experiences have led me to rethink my religious convictions			.547			.550
Q7	For me, doubting is an important part of what it means to be religious			.574			.534

(*continued on next page*)

Table 2 (*continued*)

	Item	Initial			Final		
		I	E	Q	I	E	Q
Q8	I expect my religious convictions to change in the next few years			.744			.708
Q9	It might be said that I value my religious doubts and uncertainties			.751			.758
Q10	I was not very interested in religion until I began to ask questions about the meaning and purpose of my life			.529			.578

$N_{\text{Members}} = 178$; $N_{\text{NoMem}} = 283$.

Table 3
Pearson correlations between IEQ factors in final model

	Members		Non-members	
	Intrinsic	Extrinsic	Intrinsic	Extrinsic
Extrinsic	.751		.928	
Quest	.429	.338	.856	.793

Table 4
Fit estimates for confirmatory factor analysis of Glock dimensions

Structure	χ^2	df	p	RMSEA	Group GFI member		BIC
					Yes	No	
Glock basic	877	504	.000	.051	.896	.880	−2214
Allow error covariances and different error variances	540	500	.107	.017	.925	.930	−2527

$N_{\text{Member}} = 278$; $N_{\text{NoMem}} = 642$.

3.3. Relations between IEQ and Glock dimensions

Partial correlations between IEQ and Glock's dimensions are presented in Table 7. For church members, Intrinsic religiosity correlates highest with all Glock dimensions, while correlations with Extrinsic and Quest are low, insignificant or even negative. For non-members, church attendance, and consequences of worldview correlate highest with the Intrinsic factor, while frequency of prayer, Christian worldview and experience of God in nature correlate highest with the Extrinsic factor.

For church members, these results support the view of Huber (2002) that Glock's dimensions are aspects of one centrality or Intrinsic religiosity dimension. For non-members, there seem to be two groups of Glock's dimensions, one with weak correlations with Intrinsic religiosity and one with moderate correlations to Extrinsic religiosity. However, one should remember that the Intrinsic and Extrinsic factor correlate strongly for non-members. Last but not least, none of Glock's dimensions correlates strongest with Quest religiosity.

Table 5
Factor loadings for Glock dimensions

Item	Scale					
	Church attendance	Frequency of prayer	Christian worldview	Experience of God in nature	Consequences of religion	Consequences of worldview
Church attendance	1.00					
Frequency of prayer		1.00				
There is a God who concerns Himself with every individual personally			.80			
There is a God who wants to be our God			.84			
For me, life only has meaning because of the existence of a God			.83			
Life has meaning because there will be something after death			.68			
Death only has meaning if you believe in God			.57			
Death is the passage to another life			.62			
Belief in God can bear a lot of pain			.54			
For me, sorrow and suffering have meaning only if you believe in God			.75			
Everything good that exists in the world originates from God			.83			
God ensures that, in the end, good will conquer evil			.83			
I experience God's hand in the beauty of nature				.94		
I experience God's goodness in the peace of nature				.92		
My Christian faith has great influence on my daily life					.91	
When I have to make important decisions, my Christian faith plays a major part in it					.92	
My Christian faith has great influence on my political attitudes					.76	
My life would be quite different had I not my Christian faith					.77	
Christian faith is something that interests me a great deal					.85	
My world view has great influence on my daily life						.85
When I have to make important decisions, my world view plays a major part in it						.89
My world view has great influence on my political attitudes						.70
My life would be quite different had I not my world view						.78
World view is something that interests me a great deal						.79

Table 6
Pearson correlations between Glock dimensions

	Members				Non-members			
	1	2	3	4	1	2	3	4
1 Church attendance								
2 Frequency of prayer	.579*				.281†			
3 Christian worldview	.661*	.688*			.249†	.641*		
4 Experience of God in nature	.553*	.690*	.770*		.227†	.574*	.863*	
5 Consequences of religion	.714*	.708*	.884*	.776*				
6 Consequences of worldview					.104†	.300†	.312†	.313†

$^{***}p < .001$; $^{**}p < .01$; $^{*}p < .0.5$; $^{\dagger}p < .10$ (two-tailed).

Table 7
Partial correlations of IEQ and Glock factors controlled for other IEQ dimensions

	Members			Non-members		
	I	E	Q	I	E	Q
Church attendance	**.588*****	−.123†	−.113	**.143***	−.044	−.041
Frequency of prayer	**.515*****	.273***	−.194**	.157**	**.295*****	−.048
Christian worldview	**.644*****	.081	−.253***	.147*	**.392*****	−.093
Experience of God in nature	**.543*****	.165*	−.028	.152*	**.364*****	−.074
Consequences of religion	**.712*****	−.053	−.156*			
Consequences of worldview				**.183*****	−.031	−.009

$N_{\text{Mem}} = 185$–198; $N_{\text{NoMem}} = 275$–299.
$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$; $^{\dagger}p < .10$ (two-tailed).

4. Discussion

This research aimed to provide a confirmatory factor analysis of IEQ items for both church members and non-members. Moreover, it set out to provide insight in the relationships between IEQ and Glock's dimensions. Results showed a three dimensional structure of IEQ items for both church members and non-members. Three Extrinsic items turned out to fit the model poorly and their content points in one direction: they indicate that religion is unimportant rather than useful for other goals. All remaining IEQ items showed sufficient convergent and discriminant validity and have comparable loadings for both groups. Hence, IEQ items can be used not only in religious samples but also in religiously heterogeneous samples. However, the extremely high correlations between factors for non-members suggest that the distinction of IEQ religious orientations, although theoretically relevant, is empirically not very useful in samples of non-members only.

Huber's (2002) idea of centrality is supported by strong partial correlations between Intrinsic and all Glock's dimensions among church members. However, several of Glock's dimensions correlate highest with the Extrinsic religious orientation among non-members. Investigators who use the IEQ items in religiously heterogeneous samples should be aware that the scales can behave

differently for different subsamples. However, the low(er), insignificant or even negative correlations of Glock's dimensions with Extrinsic and Quest religiosity support our view that the two distinctions of religiosity are complementary.

Although this study made substantional progress, there are still some issues to be solved. It is unknown whether the relative weakness of the IEQ distinction among non-members is due to the studied sample or inherent to the scale. Comparison with religiously heterogeneous samples from different countries may shed more light on this issue. A further test for convergent and discriminant validity would preferably also use multi method data.

For the moment, we conclude that IEQ scales, given the comparable factor structure and loadings, can be used in religiously heterogeneous samples, although one should be careful with its use in non-member samples. Research on dimensions of religiosity can benefit from the use of both the IEQ and Glock distinctions together rather than using just one of them, because they turned out to be complementary. Investigating these distinctions simultaneously will shed more light on the competitive advantages of the two multidimensional frameworks.

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